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ABSTRACT

To better conceptualize educational effectiveness, a comprehensive model (Creemers 1994) that takes as a point of departure the differences in the learning results of students was developed. To explain the differences in outcomes, this paper introduces more formal characteristics--consistency, cohesion, constancy, and control--for effectiveness in the comprehensive model. Following the introductory section and a discussion of the advances and problems in educational effectiveness research in section 2, section 3 explains the development of a comprehensive model and concludes that formal characteristics exist to some extent. Section 4 examines teachers' visions about education at the classroom level, school level, and within the wider educational context. The concept of vision combines ideas, opinions, beliefs about instruction, schools, and education in general. Visions are strongly related to concrete behavior in the classrooms and schools. Vision, in a comprehensive model for educational effectiveness, is related to factors for educational effectiveness and the formal criteria. One figure and four tables are included. (Contains 42 references.) (LMI)

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VISIONS THAT WORK

A further elaboration of the comprehensive model of educational effectiveness

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1 Introduction

In order to conceptualize educational effectiveness better we have developed a comprehensive model of educational effectiveness (Creemers, 1994). The model takes as point of departure the differences in learning results of students. It points at the importance of learning in schools, including learning processes by students and instructional processes that take place in classrooms and schools. Taking into account the research evidence about the effectiveness of textbooks, grouping procedures and especially teachers' instructional behaviour factors are formulated at the classroom level that explain differences in student outcomes. The levels above the classroom, like the departmental level, the school level and the above school level are seen as providing conditions for what happens at the classroom level. From a theoretical point of view all the factors in the model can be allocated to *time for learning, opportunity to learn and quality*. With respect to time and opportunity we distinguish the time and opportunity offered by education and the use of time and opportunity by students. We suppose that the latter is more directly related to student outcomes.

In order to explain the differences in outcomes we introduce more *formal characteristics for effectiveness* in the comprehensive model. These concern the relationships between the factors of instruction (textbook, grouping procedures and teaching behaviour), the stability of factors over time and mechanisms to 'impose' the factors. The idea behind these formal characteristics is that the influence of the factors at a certain level and between factors at different levels can be enforced or take place by the fact that these factors are pursued for a longer period of time and are in line with each other. Formal characteristics concern the *consistency* between the factors of different educational elements, the *cohesion* within the school and system to pursue certain factors over time, the *constancy* by which students are exposed to these factors during their school life and the *control* mechanisms to enhance certain factors.

Past research into factors in the model does not provide definite evidence for their contribution to effectiveness. In our research programme we are currently trying to pursue the influence of the formal characteristics, next to the factors at different levels. The main question is whether consistency between factors at a certain level or between levels and cohesion and constancy over time and a system that controls the implementation of the factors influence educational effectiveness. Section 3 presents the results of a project, so far restricted to consistency. The project concludes that formal characteristics exist to some extent. This conclusion stems from empirically based configurations of factors in schools and classrooms. However, there is another way of looking at the formal characteristics that could be more productive.

In this approach we take as a point of departure the fact that educational professionals have a *vision* about education. We expect that such a vision is related to what they actually do. Although the same holds for other people like students, parents, and civil servants involved in education, we concentrate on the teachers as the key persons in education. We will develop the concept of vision at the different levels of education like the classroom, the school and the educational context and in this way we will relate it to factors and formal criteria for educational effectiveness. We will address the question as to whether the concept of vision is an alternative idea for a comprehensive model for educational effectiveness, an addition to the model or a rephrasing of elements already included in the model.

2 Advances and problems in educational effectiveness

After the early enthusiasm in the United States for school effectiveness and school improvement, the conceptualization, research designs and results were strongly criticized. In the second half of the eighties educational research in the States already moved to other topics in education but a strong attention for theory and research in educational effectiveness came up in other countries like the UK, Australia, the Netherlands and Hong Kong. Results of that international attention for educational effectiveness can be found in the ten volumes of the journal of School Effectiveness and School Improvement, related to the International Congress of School Effectiveness and School Improvement. Handbooks and state of the art reports were published about the advances in research, theory and practice with respect to educational effectiveness (Cheng, 1996; Creemers, 1994; Reynolds et al., 1994; Sammons, Hillman & Mortimore, 1995; Scheerens, 1992; Scheerens & Bosker, 1997; Stringfield & Herman, 1996; Townsend, 1994). These show that theory and research in the area of educational effectiveness have progressed considerably recently.

Theoretical issues

Originally educational effectiveness was mainly a collection of factors that could be found in effective schools and less or not in ineffective schools. Later on theoretical models were developed that put together an increasing list of these factors in a more or less logical order. Especially in Europe attention was paid to the further elaboration of theories and models, which included the addition of factors that could improve the model. Also, a reconstruction in theoretical terms of already existing theories was pursued. This orientation put forward concepts which in relation to each other could explain differences between effective and ineffective schools. In order to increase the explanatory power of the theory new concepts were included as well.

For the development of theories it was necessary to determine what effectiveness in the end was. That has lead to further theorizing about quality and equity in education and resulted in the determination of other objectives of education, more attention for non-academic goals and the relationship between various domains of educational objectives with respect to effectiveness. Also the concept of differential effects, different outcomes of education for different groups of students, came up. In order to find a conceptual basis for educational effectiveness the focus of attention shifted from factors merely related to effective schools and classrooms to what explains learning outcomes. Especially the question as to how factors related to effective schools and classrooms could be reconceptualized in terms of causes for effects received a lot of attention.

Relating effective factors to theories about instruction is one way to increase the theoretical level of educational effectiveness. These theories in their turn are related to student learning as well. Another way is to look at schools as organisations and to relate effective factors to organisational theories, although in the end these theories are related to processes and outcomes too. A further step forward was to emphasize student learning at the classroom level in effectiveness theory and to conceptualize the contribution of the level above the classroom to what happens at the classroom level. That has resulted in a more refined specification of factors at departmental, school and other levels, especially factors that could be related to processes at the classroom level (Cheng, 1996; Creemers, 1994; Creemers & Reezigt, 1996; Scheerens, 1997; Slater & Teddlie, 1992; Stringfield & Slavin, 1992; Teddlie & Stringfield, 1993).

Empirical issues

Although the improvement that got the most attention in last years was statistical analysis in effectiveness research, other issues related to research are equally important. Recent research pays more attention to various objectives and the measurement of student outcomes. More than in the past the importance of ways to measure instructional effectiveness at the classroom level and factors at the other levels reliably and valid is emphasized. The development of instruments is based more strongly on theoretical ideas mentioned above and depends less on just a collection of more or less common sense ideas about what might be related to the effects of education. Furthermore research pays attention to issues of stability, size and relevance of effects (Goldstein, 1997; Scheerens & Bosker, 1997; Thomas, Sammons, Mortimore & Smees, 1997; Van der Werf & Guldemond; 1996).

Effectiveness research and improvement of education

Although educational effectiveness could be conceived as an academic research program, it started out and still is a program for the improvement of education as well. In educational practice, theory and research find a place to test and prove the ideas. Educational practice can benefit from theoretical insights and contribute to the further elaboration of theory and research. In the last decade, attention for the complicated process of the implementation of research results into practice and the way educational practice can contribute to and influence the research program has grown. A new way of merging educational effectiveness research and school improvement can contribute to further advances in the methodology of research and promote longitudinal studies, case studies and real life experimental studies (Creemers & Reezigt, 1997; Gray, Reynolds, Fitz-Gibbon & Jesson, 1996; Hopkins, 1996; Hopkins & Lagerweij, 1996; Reynolds et al., 1996).

Looking at the advances, the research programme and the related school improvement seem to have greatly improved. However, not only optimistic conclusions can be drawn. There are also some problems.

- First, it seems that the advances are made particularly in the field of theory development, designs, and research techniques including statistical procedures. Although the major proportion of variance in student outcomes is accounted for by background factors like students' ability, motivation and the home environment, it is still hard to relate the small proportion of variance accounted for by schools and classrooms to specific factors discussed in the literature.
- Sometimes research detects a factor with significant effects and then a specific research project is quite positive with respect to the contribution of that factor. However, many factors do not seem to be very stable in their effects. This means that not only outcomes of classroom and schools are unstable, but the factors which can explain the outcomes are quite unstable too. Research has paid attention to stability issues with respect to the effects of education, but more important for the further theory development and the empirical validation is the stability of the factors that explain the effects.
- Research is full of anomalies and contradictory evidence. For example, homework is sometimes positively related to outcomes (Walberg & Paschal, 1995) and sometimes negatively (Kuyper & Swint, 1996). Sometimes the school level explains

unexpectedly more variance than the classroom level, which we expect to contribute more to effectiveness. When more effectiveness criteria are taken into account the picture becomes even more diverse.

- The quality of research has not improved sufficiently, maybe because the improvement in theory was not accompanied by further development of research. An explanation could be the funds available for research or the fact that new insights become available at a time when research studies have already been designed. Especially the design of longitudinal studies takes time and subsequently the study has to be carried out according to the research plan, even though in the meantime new ideas come up. Such studies therefore are criticized even before they are published. The effectiveness research basis in the Netherlands for example is formed by cohort studies which are not designed completely in line with new insights about effectiveness. Nevertheless they are still used as an empirical basis for effectiveness research. This situation may explain some of the disappointing results.

When the advances are compared with the problems, the conclusion may be drawn that the cleverer we are in theory and conceptualization, the less we succeed in finding empirical support for our position. A better conceptualization and theoretical interpretation of educational effectiveness alone cannot bring things further. Research is not consistently designed on the basis of a theoretical framework but is often based on the availability of datasets which offer only some factors related to effectiveness. Still, several studies were published which at least proved our understanding about the effectiveness of education. Although there are complaints about the quantity of research studies, there are internationally many interesting studies (Hill & Rowe, 1996; Cheng, 1996; Townsend, 1997). Generally they prove the importance of the classroom level and bring forward factors that more or less resemble factors that were already discerned.

The problem however is that theory and research are not in line with each other. The theory, departing from theories about learning, instruction, and organisation, tries to put together in a comprehensive way the factors that are important for effectiveness. But research is not able to provide empirical support for considerable parts or components of the specific theories. As a result both theory and research do not provide a firm basis about what works in education and why.

It was and still is a purpose of the comprehensive model of educational effectiveness (Creemers, 1994) to improve this situation and to enhance further development of the theory together with empirical research. Theory and research should be more in line with each other, which means that research should be based on theoretical considerations and the results of research should lead to further development and reinterpretation of the theoretical model.

3 Development and research of the comprehensive model

Like other models developed in the nineties (Scheerens, 1992; Stringfield & Slavin, 1992; Stringfield, 1994, Slavin, 1996) the comprehensive model distinguishes between levels in education (Creemers, 1994). Higher levels are supposed to provide the conditions for what happens at the levels below. This means that not just one level induces results but the combination of levels.

Most models are rather detailed at the classroom level, while the school level often shows a more diffuse selection of variables. Factors are listed based on ideas about how

the school level can provide conditions for the instructional level and also on insights from organizational theories. In the QAIT-MACRO model (Stringfield & Slavin, 1992) these factors are meaningful goals, attention to academic functions, coordination, recruitment and training, and organization. The model of Scheerens (1990) lists achievement orientation, organization of the school in terms of educational leadership and consensus, quality of the school curricula in terms of content coverage, form and structure, and an orderly atmosphere. But how these factors influence what goes on at the classroom level, between classes at the same grade level and between grade levels, remains unclear.

Quality, time and opportunity

The comprehensive model of Creemers (1994) is based on the key concepts of quality, time and opportunity. These concepts are defined at each educational level. Each level has its own factors which fill in the key concepts. The factors are selected because of their relation to one of the key concepts and preferably also because they have empirically demonstrated an impact on student outcomes.

The main aim of the Creemers model is to explain differences in student outcomes (basic skills, higher order skills, and metacognitive skills) by means of educational factors. The model is based on the Carroll model of school learning (1963). A central concept of the Carroll model, time, plays a central role in the Creemers model too but it is now systematically complemented by the concept of opportunity to learn. The main differences between the models can be found in the definitions of the role of the teacher and of levels higher than the classroom. The Carroll model focuses almost exclusively on the student level, whereas the classroom level is not specified in much detail. The only classroom factor mentioned is quality of instruction. In contrast, Creemers puts quality of instruction at the core of his model and integrates findings from several research traditions to give more meaning to the factors that constitute quality of instruction. The model has four levels: the student level, the classroom level, the school level and the context level.

insert Figure 1

The Creemers model builds on the following assumptions.

- Quality, time and opportunity to learn are the key concepts in the model. Time on task and opportunities used (student level) are influenced by time for learning and opportunity to learn provided by the teacher (at the classroom level), and these are influenced in turn by the quality of instruction. However, quality, time and opportunity at the classroom level are influenced by factors at the school level that may or may not promote these classroom level factors. For example, a teacher will have trouble in achieving high levels of time for learning in his classroom when the school does not have a supportive policy. The same holds for context factors as conditions for school factors. So, quality, time and opportunity are not only the key concepts at the classroom level but at the school and the context level as well.
- The influence of context, school and classroom level factors is mediated by time on task and opportunities used at the student level. Teachers are able to influence time for learning and opportunity to learn in their classrooms by the quality of their instruction. The more adequate their instruction, the more time students can actually spend on learning and the more opportunities to learn they will have. For example, more school subjects or topics within subjects will be offered. But even

when teachers achieve very high levels of time for learning and opportunity to learn, ultimately the students decide how much time they will actually spend on their school work and how much opportunities to learn they will actually use. Therefore, these concepts are directly related to achievement. In addition, student achievement is also determined by student factors such as aptitudes, social background, and motivation.

- The higher levels are conditional for the lower levels. Factors at the context level are conditional for factors at the school level, factors at the school level are conditional for factors at the classroom level, factors at the classroom level are conditional for student achievement. Student achievement cannot be seen as either an accomplishment of classroom level factors only (as in many studies on teacher behaviour) or of school level factors only (as in many studies of school policies), but it should be seen instead as a result of both levels.
- Although the context and school level factors are supposed to influence achievement, they are not supposed to influence achievement directly. Their influence is indirect and mediated by at the classroom level.
- All factors in the model are conceptually related to one of the key concepts. If not, the factor does not fit into the model and is left out. For example, a school level factor is often considered effective is the leadership capacity of the principal or deputy (Mortimore et al., 1988). In this model, leadership capacities as such are not considered an essential feature but the way a principal or a deputy enhances quality, time or opportunity is.

Factors at the student level

The students' background, their motivation and their aptitudes strongly determine their achievement. Time on task is the time students are willing to spend on school learning and on educational tasks. It is determined not only by motivation, but also by the time provided by the school and by processes at the school and classroom levels. Time on task is the time students are really involved in learning, but this time has to be filled by opportunities to learn. These opportunities concern the supply of learning materials, experiences, and exercises by which students can acquire knowledge and skills. In fact, learning opportunities are the instructional operationalisation of the objectives of education, whereas tests are the evaluative operationalisation of the same objectives. In this respect one can speak about the content coverage of the curriculum. A distinction is made between opportunities offered in the instructional process and students' actual use of the offered experiences.

Factors at the classroom level

Next to time and opportunity, the quality of instruction determines the outcomes of education. The three components of quality of instruction are the curriculum, grouping procedures and teacher behaviour. Based on theoretical notions and empirical research, effective factors of these components of quality of instruction were selected for inclusion in the model. It is obvious that teachers are the central component in instruction at the classroom level. They make use of curricular materials and they actually carry out grouping procedures in their classrooms. However, teachers need curricular materials, which should be consistent with the grouping procedure used.

With respect to curriculum the selected factors are:
- explicitness and ordering of goals and content;
- structure and clarity of content;
- advance organizers;
- material for evaluation of student outcomes, feedback and corrective instruction.

With respect to grouping procedures they are:
- mastery learning;
- ability grouping;
- cooperative learning;
  highly dependent on differentiated material, material for evaluation, feedback and corrective instruction.

With respect to teacher behaviour they are:
- management, orderly and quiet atmosphere;
- homework;
- high expectations;
- clear goal setting (restricted set of goals, emphasis on basic skills, emphasis on cognitive learning and transfer);
- structuring the content (ordering of goals and content, advance organizers, making use of prior knowledge of students);
- clarity of presentation;
- questioning;
- immediate exercise after presentation of new content;
- evaluation, feedback and corrective instruction.

Factors at the school level

Looking at the wellknown lists of effective school factors (Levine & Lezotte, 1990; Scheerens, 1992; Reynolds, 1993), it becomes clear that most factors in fact reflect the indicators of quality of instruction, time and opportunity to learn at classroom level. Because of a lack of research studies that analyse school and classroom level together, it is hard to say what the contribution of the school factors might be in accounting for student level variance when controlling for classroom factors. In any case, many school level factors are rather meaningless when not clearly linked to classroom factors (Creemers, 1992). Even if they have an independent effect on student achievement, it is still not clear how this effect comes about and how it should be interpreted.

The model defines all school level factors as conditions for classroom level factors. This definition restricts the selection of school factors only to those factors conditional for and directly related to quality of instruction, time or opportunity to learn. Except for basic factors such as the presence of a time schedule and a school curriculum, the school factors refer to the shared responsibilities and ideas of teachers when they want to work as a team. Most school factors have to do with a system of rules and agreements between teachers about their classroom practice and facilities to implement and to control these rules and agreements. The quality factors at the school level are divided in two groups: educational factors that deal directly with what is going on in the classrooms, and organisational factors that determine what happens in classrooms from a greater distance. To enhance the quality of instruction at the classroom level, a school should cover both groups of factors. In addition, a school should watch over time and opportunity as well.

At the school level, the conditions for the quality of instruction with respect to the educational aspects are:

- rules and agreements about all aspects of classroom instruction, especially curricular materials, grouping procedures and teacher behaviour, and the consistency between them;
- an evaluation policy and a system at the school level to check student achievement, to prevent learning problems, or to correct problems at an early stage. This includes regular testing, remedial teaching, student counselling, and homework assistance.

With respect to the organizational aspects of the school level, important conditions for quality of instruction are:

- a school policy on intervision and supervision of teachers, departmental heads and school principals (educational leadership), and a school policy to correct and further professionalise teachers who do not live up to the school standards;
- a school culture inducing and supporting effectiveness.

Conditions for time at the school level are:

- the development and provision of a time schedule for subjects and topics;
- rules and agreements about time use, including the school policy on homework, student absenteeism, and cancellation of lessons;
- the maintenance of an orderly and quiet atmosphere in the school.

Conditions for opportunity to learn at the school level are:

- development and availability of a curriculum, school working plan or activity plan;
- concensus about the 'mission' of the school;
- rules and agreements about how to proceed, how to follow the curriculum, especially with respect to transition from one class to another or from one grade to another).

Factors at the context level

The same components as mentioned before, quality, time and opportunity to learn can be distinguished at context level. Quality regards the following conditions:

- a (national) policy that focusses on effectiveness of education;
- the availability of an indicator system and/or national policy on evaluation/a national testing system;
- training and support systems promoting effective schools and instruction;
- funding of schools based on outcomes.

Time at the context level refers to national guidelines with respect to the time schedules of schools and the supervision of the maintenance of schedules. The opportunity to learn at the context level refers to national guidelines and rules with respect to the development of the curriculum, the school working plan and the activity plan at the school level, for example, by a national curriculum.

Formal criteria: consistency, cohesion, constancy and control

In addition to the factors at the classroom, school and context levels, more formal characteristics can be discerned (Creemers, 1992). Although focussing on the factors, the model also makes tentative statements about their joint impact on student achievement by introducing the formal criteria of consistency, cohesion, constancy and control.

The *consistency* principle can be described at the classroom, school and context levels. According to this principle, the effectiveness of classrooms, schools and contexts is enhanced when the factors at these levels are in line with each other and support each other. For example, a math curriculum which offers tests and corrective instruction might promote evaluative behaviour of the teacher much stronger than a math curriculum not offering these facilities. Although all selected factors at the classroom level are supposed to be necessary for effective education, an emphasis on one factor might reduce the impact of another factor (Gamoran, 1986). For example, the implementation of a very refined and detailed grouping procedure might be so demanding for teachers that the actual time for learning in their classrooms is reduced.

At the school level consistency between the components is an important condition for instruction. All members of the school team should take care of that, thereby creating *cohesion*. Creemers (1991) points at the importance of continuity, meaning that schools should not change rules and policies every other year. This implies the *constancy* principle, which can be demonstrated in longitudinal research by comparing school level factors from year to year. The *control* principle not only refers to the fact that student achievement should be evaluated, but also to the quiet atmosphere in the school. Control also refers to teachers holding themselves and others responsible for effectiveness. At the context level consistency, constancy and control are again important formal characteristics emphasizing the importance of factors over time and of mechanisms to ensure effectiveness.

Especially the formal criteria were considered a major improvement of the theory compared with other models, because these criteria hold together the other factors in the model and explain their joint impact.

3.2 The effects of configurations of school level and classroom level factors on student achievement

Effectiveness research has led to a large set of effective classroom and school factorsall supposedly affecting student achievement. Lists of these factors suggest that they are all equally important. They do not distinguish between classroom and school factors and they do not pay attention to the mutual influence of factors at both levels. The comprehensive educational effectiveness model of Creemers (1994) tries to overcome these problems by relating the isolated factors to a specific level of effectiveness (i.e. the classroom level, the school level, the context level) and to the overarching effectiveness key constructs of quality, time and opportunity. Moreover, isolated factors can boost each other's effects when applied together as meaningful configurations. In such a configuration, factors do not oppose each other or hinder each other's effects on student achievement but are in line with each other (the consistency principle).

To test the empirical validity of the effectiveness model, two research questions were answered (Reezigt, Guldemond & Creemers, 1997):

- Do the classroom and school factors defined in the model have the expected effects on student achievement?
- Is it possible to find configurations of factors at the classroom and the school levels which can be considered as examples of the consistency principle, and if this is so, what are their effects?

The factors in the model are expected to have positive effects on achievement. In fact, most of the factors were included because they had empirically shown to have positive

effects. However, most effectiveness research so far has not focused on a lot of factors at the same time. Most research studies some factors and leaves out most of the others that might be important as well. Therefore it is possible that some factors take away each other explanatory power when they are analyzed together. As a consequence the absence of effects is also considered in line with the expectations of the model. Only negative effects of factors are directly opposed to the hypotheses put forward by the model. According to the consistency principle, configurations with a higher level of consistency might be expected to have more positive effects on student achievement. A consistent configuration of factors at the classroom level means that the curriculum, the grouping procedures, and the behaviour of the teacher are in line with each other, thereby promoting time for learning and opportunity to learn and, in the end, student achievement. A consistent configuration of factors at the school level means that the variables measuring quality, time and opportunity all go in the same direction and do not reduce each other's effectiveness.

To answer the first research question, multilevel analysis (VARCL, Longford, 1988) was applied using three levels (students nested within teachers nested within schools). The study included two dependent variables (language achievement and math achievement) and three cohorts of elementary school students. To answer the second research question, cluster analysis was performed as a first step to define configurations of factors as more or less consistent. Additionally, three-level analysis was performed to test the effects of the configurations on student achievement.

Data initially collected for the evaluation of the Dutch Educational Priority Policy were reanalyzed. The data refer to a random sample of elementary schools which is representative for the Dutch elementary school population. Repeated measurements took place in 1988, 1990 and 1992. A total of 129 schools and 516 teachers (258 from 1990, 258 from 1992; two teachers per school) were used in the reanalyses. The number of students varies from 1531 (one cohort) to 3762 (two cohorts). Students from grades 4, 6 and 8 (age groups 8, 10 and 12) took several tests in the beginning of the school year. The teachers filled in written questionnaires and so did the principals of the schools. Because of the repeated measurements, several subsequent cohorts of children in the same schools can be studied. One cohort of students has been tested three times during their school career: they were in grade 4 in 1988, in grade 6 in 1990 and in grade 8 (the final grade of Dutch elementary education) in 1992. All other student cohorts have been tested once or twice.

The dependent variables were math and language achievement. The achievement measurement corrected for 2 years earlier refer to two cohorts of students (the students that were in grade 4 in 1988 or in 1990 and in grade 6 two years later, and the students that were in grade 6 in 1988 or in 1990 and in grade 8 two years later). The achievement measurement corrected for 4 years earlier concerns one cohort of students, who were in grade 4 in 1988, in grade 6 in 1990 and in grade 8 in 1992. The teacher level was not appropriate for these analyses because of nesting problems.

The independent variables were 11 classroom factors: quality of the curriculum, implementation of the curriculum, use of curriculum tests, grouping procedures, homework, clear goal setting, evaluation, feedback, corrective instruction, time for learning and opportunity to learn. There were 6 school factors: school rules about classroom instruction, evaluation policy, intervision policy (professionalisation of the school team), rules about the use of time, orderly atmosphere, rules about the implementation of the school curriculum. All factors were directly derived from the Creemers model.

Effects of factors

After controlling for the student level factors small proportions of variance remain at the classroom and the school level that may be accounted for by the classroom and school factors derived from the model. Table 1 gives an overview of the statistically significant regression coefficient estimates of these factors.

insert Table 1

Most student factor effects are fairly stable over subjects as well as over the dependent variables, except for the gender effects. Prior achievement and intelligence show consistently positive effects on achievement, while a lower social class background or an ethnic minority background show consistently negative effects. The effects are much stronger for achievement over 4 school years than they are for achievement over 2 years.

Concerning the classroom factors, Table 1 shows negative or mixed (sometimes positive, sometimes negative) effects on student achievement of 3 factors: feedback, time for learning and opportunity to learn. There are 4 factors that do not have any affect at all: use of curriculum tests, grouping procedures, evaluation and corrective instruction. Four classroom factors have positive effects: quality of the curriculum, implementation of the curriculum, homework and clear goal setting. These positive effects are not very stable over effectiveness criteria and school subjects, however. In fact, only homework and clear goal setting show stability in the way the effectiveness model assumes.

Concerning the school factors, the picture is not essentially different: 2 school factors (rules about classroom instruction and evaluation policy) have mixed effects, 2 more school factors have negative effects (policy on intervision and rules about time use) and 1 school factor (rules about the implementation of the school curriculum) has no effect at all. Only 1 out of 6 school factors shows a positive impact on achievement (orderly atmosphere) but this effect is not stable over effectiveness criteria and school subjects.

To summarize, some factors show expected effects, i.e. either positive effects or no effects. The other factors show negative effects, which is contradictory to the expectations of the effectiveness model. Even when factors have positive effects, these are not stable across analyses, i.e. across cohorts of students and across school subjects.

Effects of configurations

The cluster analyses at the classroom level yield five interpretable clusters for language and three for mathematics. At the school level three clusters were found. Both at the classroom level and at the school level there is always one cluster standing out in a negative sense. Teachers and schools in these clusters show consistently low scores on all factors. Therefore, these clusters can be considered overall ineffective.

At the classroom level, 14 % of the teachers in the analysis for language belong to the overall ineffective cluster. There are four more language clusters, one of which stands out in a clearly positive sense. Teachers in this overall effective cluster (36 %) have high scores on more than half of the classroom factors. The teachers in the three remaining language clusters have high scores on a limited set of classroom factors only. They focus on classroom factors related to grouping (18 %), related to evaluation (4 %) and related to homework and clear goal setting (28 % of the teachers).

The three math clusters are the overall ineffective cluster (39 % of the teachers), focus on instruction (13 %) and focus on opportunity (48 %). Table 2 gives an overview of the classroom level clusters.

insert Table 2

The school level clusters are the overall ineffective cluster (43 % of the schools), focus on rules and order in the school (36 %) and focus on school policy (21 % of the schools). Table 3 gives an overview of the school clusters.

insert Table 3

According to the consistency principle, factors within levels can be more or less consistent and in line with each other. When we apply the consistency principle the overall effective cluster (language, classroom level) and the overall ineffective clusters (language and math, classroom level and school level) can be seen as consistent in a positive or negative sense. The effects of the clusters were contrasted with the effects of the overall ineffective classroom and school clusters. Therefore, we expect all effects of the remaining clusters to be positive. Furthermore, we expect that the effects of the overall effective clusters are the strongest. Table 4 shows the significant regression coefficients.

insert Table 4

The findings partly support our expectations. The language clusters show two positive effects, caused by the clusters which focus on evaluation and homework/goals. The other effects however are not as we expected them to be. The overall effective cluster, the one which lives up in a positive sense to the consistency principle, does not differ in its effects from the overall ineffective cluster, which can be seen as the dark side of the consistency principle. The cluster which focuses on grouping shows negative effects. This implies that the effects of this cluster are even more negative than the effects of the overall ineffective cluster, the contrast cluster in this analysis.

The math clusters do not show any effects on student achievement at all. The two clusters that should stand out positively when contrasted with the overall ineffective math cluster do not differ in their effects on achievement from this contrast cluster. Finally, the school level clusters which we expected to show positive effects, instead have negative or mixed (sometimes positive, sometimes negative) effects on achievement. The fit of the full model, which includes both the classroom and the school clusters, does not improve compared to the model which includes the student factors only. Our main conclusion is that although we have found clusters that support the consistency principle, the analyses do not support our expectation that consistency leads to higher outcomes.

3.3 Conclusion

The comprehensive model for educational effectiveness is an example of models that try to meet the criteria for theory development within the educational effectiveness area, taking a plausible theory about student learning in schools as a point of departure and describing factors, formal criteria and relationships in detail. Although the model can be criticised (for example, the context level could be elaborated further, the reasons to include or to

exclude certain factors could be discussed) it is a plausible model based on reviews of research. Components of the model are supported by earlier studies.

The study described above does not support the model very well. There may be several reasons. The study merely performed reanalyses on data which were not collected specifically to test the model. The data probably are not specific enough to test the theory. Also the model itself should be investigated for weaknesses. Other effectiveness models are also sometimes supported by research, but not completely. There seems to be a general need for further theory development. In the following, our considerations will be related and restricted to the comprehensive model of Creemers (1994). We know now that educational effectiveness is caused by a multitude of factors, not just by one or a small set. The following recommendations can be made for the next future:

- We need more research on the basis of theoretical frameworks that are now available. As yet the discrepancy between theoretical insights and the research base is too large. We need more sophisticated techniques but most of all we need research not restricted to outcomes but incorporating educational processes at the classroom and school level. We should not restrict our research programme to isolated problems like stability and size of effects or isolated factors. It will be hard to test the full model, but at least more levels, more factors and more relationships between factors should be pursued in research.
- We need longitudinal studies, experimental studies and case studies. We should not only measure the added value of education but also what causes that added value. Because we expect that a lot of things go on between pre- and posttest we should repeatedly measure what goes on in classrooms and schools. Probably the stability of effects is caused by the consistency and constancy over time of the classroom and factors. So far we do not have much insight in the role of formal criteria like consistency, constancy, cohesion and control of the factors in schools.
- When experimental studies and longitudinal studies are integrated the relationship between effectiveness research and educational improvement becomes quite close. Preferably school improvement projects should measure what goes on in classrooms and schools and they should continue to introduce factors related to effectiveness.
- Probably we have to take our theory somewhat further on by facing the problem that teachers, schools and maybe even systems hold opinions and are driven by something which makes them more or less willing and capable to pursue educational effectiveness. We want to elaborate our theory on the fact that educational professionals are more or less willing to pursue effectiveness and to maintain factors that have been proven to be effective.

The next section will discuss the further elaboration of our theory with the introduction of visions at the different levels of the educational system in more detail.

4 Visions that work

The comprehensive model (Creemers, 1994) contains factors at several levels, it includes several components and formal criteria for effectiveness. In this sense the model is really what it is called: comprehensive. It summarizes almost everything we can think about related to educational effectiveness. However, as yet the model is not very well supported by empirical evidence. An explanation could be that the formal criteria of effectiveness which deal with questions as to how much in line factors are and how stable they are over time are not often found. That could be related to the fact that teachers do not show that

kind of behaviour very much, at least not in the time the observer is there or when they are answering questions about their behaviour.

We expect that teachers, school teams and departments who pursue effectiveness more consistent, frequent, constant, and permanent achieve higher outcomes. We assume that there is a certain drive in teachers, school teams and departments that enforces them to pursue effectiveness. Pursuing effectiveness means carrying out effective education by providing effective instruction and creating conditions at other levels to enhance effective instruction. The model already has some factors related to that drive, like high expectations of the teacher and the school mission. The drive that can be found at all levels of education is a vision.

A vision contains presuppositions about life and society in general. More important, a vision is an idea about what has to be achieved in a school and how it should be achieved based on values and norms. In education, these values and norms are related to the aims and functions of the school, and the tasks and positions people have. The concept of visions that work relates to the fact that visions, although based on general presuppositions about life and values and norms, are not abstract but related to concrete behaviour in classrooms and schools. A vision is a value and belief system of teachers with respect to their place and function in the educational system combined with the things they do based on that vision. A vision is the total of values and norms about education and the specific place, tasks, and functions persons have, based on the context they live in and related to what they actually do. We expect that almost everybody in the educational profession has ideas, opinions, conceptions, and beliefs about education and the objectives of education that are part of their belief system and that makes them pursue effectiveness more or less strongly.

There is certainly a lot of research evidence showing that having an opinion does not necessarily mean that that opinion leads to a concrete action. There is a difference between beliefs and opinions on the one hand and acting on the other hand. The arguments and evidence for that discrepancy can be found in schools. Dutch findings of research into the development of school working plans where schools were supposed to develop their own ideas and objectives about education can illustrate this. There is hardly any relationship between school working plans and what actually happens in schools (Van der Werf, 1988). There is hardly any relationship between statements about aims and objectives and the effectiveness of education. Contra evidence can also be found in the progressive schools movement, such as schools based on the ideas of Maria Montessori. Sometimes education in these schools is quite effective because the teachers are strong believers and pursue their ideas and ideals with great persistence and passion in educational practice.

Aspects of the concept of vision are already included in models of school effectiveness. We expect that teacher expectations and beliefs contribute to educational outcomes. In the comprehensive model ideas and actual behaviour are intertwined. We can improve the model by distinguishing between visions as the total of opinions and beliefs about education and the function persons have with respect to that, specific places that can motivate them to pursue and to show effective behaviour. Now visions can be subject for educational research and the relationships between visions at different levels and what actually happens can be investigated. Because past research was directed to actual behaviour, factors related to visions could not be found but now, by making this distinction, appropriate instruments for the investigation of visions can be developed and the concept can be studied more adequately.

When we assume that visions can actually contribute to educational effectiveness we suppose that there is a relationship between visions, factors and formal criteria for effectiveness. Because of this, we have named this section 'Visions that work'. Visions that work are the total of ideas, beliefs, and expectations with respect to education of a person or a group of persons (departments, schools, districts, nations), the objectives of education and the way these should be achieved. Because effectiveness is at stake the means of pursuing the objectives and the means to put the beliefs about education into practice are the factors and formal criteria related to educational effectiveness. We expect that educational effectiveness is more consistent, cohesive, constant and controlled when an apprpriate vision provides a basis than when there is no vision at all, or there is a vision but it is not or not clearly related to educational effectiveness factors.

So far there is no direct research evidence for the importance of visions that work at various levels, but some circumstantial evidence does exist.

The classroom level

We think that teachers who have a vision related to educational effectiveness expect their students to learn through education and expect that their instructional procedures contribute to student outcomes. They have high expectations about their students, which means that they expect them to learn and to achieve. Because they have objectives and aims for their own behaviour and for their students they pursue effectiveness. They are constantly involved in what contributes in their teaching behaviour and in the instructional processes to effectiveness. Teachers are not only aware of the importance of factors related to time for learning, opportunity to learn and quality of education, but they are also aware of the importance of the formal characteristics like consistency. They expect support from the departmental and school level, not only with respect to time, opportunity and quality but also in the formal characteristics like consistency, cohesion,constancy and control. They expect support from the curriculum, from coaching, in-service training and further professionalisation. They expect educational leadership from department heads and school principals. Moreover they expect that they as teachers can contribute to a vision at other levels too. This is important because a shared vision is expected to contribute to cohesion and constancy. Circumstantial evidence for the importance of visions that work at the classroom level can be found in research on high expectations of teachers and their effects on teaching and learning processes and outcomes.

Departmental and school level

Visions that work at these levels are the shared visions of members of departments or school about the objectives of education, the way these objectives should be pursued and the means they have to achieve the objectives. We expect teachers as professionals to contribute to this shared vision but educational leaders (heads of departments, principals) may also take the lead in formulating a shared vision. Visions that work are strongly related to what happens in schools and departments and especially what should happen at the classroom level. Visions deal with the objectives of education, with opinions of how much education and schools can contribute to achieve the objectives. Visions that work include clear ideas and opinions about how to pursue objectives within the classroom, department and school.

Negative circumstantial evidence can be found in Dutch research on school working plans which were not related to educational practice (Van der Werf, 1988). Positive evidence can be found in school work plans in the United Kingdom where ideas turned out to be related to educational practice (Hargreaves & Fullan, 1992). Improvement projects like Sedherot (Bashi et al., 1990) also prove the importance of shared visions on education in relationship to effectiveness factors. These projects have a strong drive to pursue educational effectiveness in practice. The ideas developed by Stringfield (1995) about high reliability organizations can also be seen as a way to create visions within schools to maintain high levels of effectiveness. Unexpected effects of innovations in progressive schools or Montessori schools (unexpected because the actual instructional behaviour is not always effective) can also be reinterpreted as circumstantial evidence for the importance of visions that work. Even when visions are not so strongly related to effectiveness factors and sometimes even contrary to it, visions themselves were impressive enough to maintain an educational practice with results in children's behaviour or outcomes in schools for a long period of time .

The levels above the school

The levels above the school also contain visions, strongly related to ideas about education in the society or in a part of the society. These visions concern the importance of education, what education should be like, which objectives should be achieved and how they should be achieved. For some empirical evidence we refer to international comparative research which shows the importance of visions (Reynolds & Farrell, 1996; Reynolds et al., 1997). Because the above school level is more distant from the classroom processes visions at thes level deal with topics such as the structure of education, the role of the community, the contribution of parents, the relationship between parents and schools, national evaluation and monitoring systems and the national curriculum. Countries with a strong emphasis on the importance of education, with high expectations about the contribution of schools to the achievement of educational goals and the provision of conditions, the structure and resources for schools to achieve objectives achieve higher outcomes. Visions in a specific society are not just ideals about education, but visions that work because they are related to measures to be taken by the above school levels and in that way related to educational effectiveness at lower levels.

We have seen that visions have to be related to the factors of educational effectiveness and to the formal criteria of effectiveness. Visions emphasize the objectives of education and the importance of conditions and processes to achieve those objectives. Visions also emphasize the fact that there should be consistency, cohesion, constancy and control.

Visions that work are not an alternative for the comprehensive model of educational effectiveness. They are a further elaboration of the model, not by introducing new factors and new formal criteria but by holding together within a level and between levels the factors that induce consistency for a longer period of time (constancy) for all members of the school team (cohesion) including a control mechanism in order to assure at all levels effectiveness over a long period. Vision as a concept is not included in the comprehensive model so far, It is an addition but it does not provide new factors nor new formal criteria. We expect that the concept of vision holds together the factors and criteria that are already available in the model. We therefore add vision to the model at different levels and connect it with factors such as expectations and mission.

5 Conclusion

Based on research, theory development, and rethinking of the comprehensive model we conclude that a further elaboration of the model is desirable. The concept of vision is introduced at the various levels of the model as an overarching factor like time, opportunity and quality. The concept of vision combines ideas, opinions, beliefs about instruction, schools and education in general. The addition 'that work' emphasizes that visions in educational effectiveness are strongly related to concrete behaviour in the classrooms and schools. Vision, in a comprehensive model for educational effectiveness, is related to factors for educational effectiveness and the formal criteria. Visions that work imply that teachers and others accomplish these factors and criteria.

This addition has implications for the research programme into educational effectiveness. Visions can be included at all levels and induce research into the ideas that professionals have about educational effectiveness and how these ideas are related to factors and criteria for effectiveness. In this way we can acquire knowledge about why educational effectiveness is achieved sometimes but not always. We do not only know what happens in education but we also know why it happens. We do not only know what schools and classrooms achieve different outcomes but we can also explain what causes the differences. As such the concept of vision can contribute to further theory development about cause-effects relationships in educational effectiveness and the explanation of these relationships.

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Table 1 **Effects of student, classroom and school level factors on language (L) and math (M) achievement; L2 means achievement corrected for prior achievement two years earlier, L4 corrected for fours years earlier (between brackets for L4 and M4 is explained whether the first or the second teacher in the analysis is causing the effect)**

dependent variable	L2	L2	L4	M2	M2	M4
grand mean	49.4	42.3	57.2	20.8	35.8	34.2
student level factors						
- prior achievement	.4	.4	.3	.5	.5	.4
- intelligence	.2	.2	.2	.2	.2	.3
- gender (girls)		1.4		- 2.8	- 1.1	- 3.2
- Dutch lower social class	- 2.9		- 4.3	- 2.4		- 3.4
ethnic minority	- 7.7	- 7.3	-12.3	- 4.5	- 2.5	- 6.1
classroom level factors						
- quality curriculum						2.1 (2)
- implementation curriculum			1.2 (2)			
- use of curriculum tests						
- grouping procedures						
- homework			1.2 (2)	.8		
- clear goal setting		.7	1.7 (1)	.8		2.5 (1)
- evaluation						
- feedback			- 2.2 (2)		1.2	- 1.8 (2)
- corrective instruction						
- time for learning	- .1		- .1 (1)			
- opportunity to learn		- .1	- .1 (2)	.1		
school level factors						
- rules classroom instruction	.2	.4				- .5
- evaluation policy	.3		.4		- .2	
- intervision policy						- .3
- rules time use	- .5					
- orderly atmosphere						.7
- rules implementation curriculum						
% of variance not accounted for						
- student level	62	56	70	51	49	54
- classroom level	3	5	n.a.	4	4	n.a.
- school level	2	1	2	3	3	6
- total	67	62	72	58	56	60
improvement of the fit of the model, compared to the model including only the 4 student factors	no	no	yes	no	no	yes

Table 2 **Clusters classroom level, language and mathematics (based on 11 classroom factors, n=540 teachers)**

clusters language	*% teach.*	*number of factors on which teachers in the clusters achieved a high score*
1. overall effective	36	7 (quality curriculum, implementation curriculum, evaluation, feedback, corrective instruction, time for learning, opportunity to learn)
2. focus on grouping	18	5 (use of curriculum tests, grouping, feedback, corrective instruction, time for learning)
3. focus on evaluation	4	3 (quality curriculum, use of curriculum tests, evaluation)
4. focus on homework/goals	28	2 (homework, clear goal setting)
5. overall ineffective	14	none
total	100	
clusters math		
1. focus on instruction	13	7 (quality curriculum, grouping, homework, evaluation, feedback, corrective instruction, time for learning)
2. focus on opportunity	48	6 (implementation curriculum, use of curricular tests, clear goal setting, feedback, corrective instruction, opportunity to learn)
3. overall ineffective	39	none
total	100	

Table 3 **Clusters school level (based on 6 school factors, n=135 schools)**

	% sch.	*number of factors on which the schools achieved a high score*
1. focus on rules/order	36	3 (rules instruction, rules time, orderly atmosphere)
2. focus on school policy	21	3 (evaluation policy, professionalisation policys, rules implementation curriculum)
3. overall ineffective	43	none
total		100

Table 4 **Effects of classroom and school clusters on language and math achievement (between brackets for L4 and M4 is explained whether the first or the second teacher in the analysis is causing the effect)**

dependent variable	L2	L2	L4	M2	M2	M4
grand mean	41.6	38.4	53.2	34.7	27.4	43.9
classroom level: clusters language						
- 1 overall effective - 2 focus on grouping - 3 focus on evaluation - 4 focus on homework/goals	2.9		- 4.6 (2) 2.4 (1)			
classroom level: clusters math						
- 1 focus on instruction - 2 focus on opportunity						
school level						
- 1 focus on rules/order - 2 focus on school policy		1.6			2.2	- 3.8 - 2.9
% of variance not accounted for						
- student level	62	56	70	51	49	55
- classroom level	3	5	n.a.	4	4	n.a.
- school level	2	1	4	4	3	10
- total	67	62	74	59	56	65
improvement of the fit of the model, compared to the model including only the 4 student factors	no	no	no	no	no	no

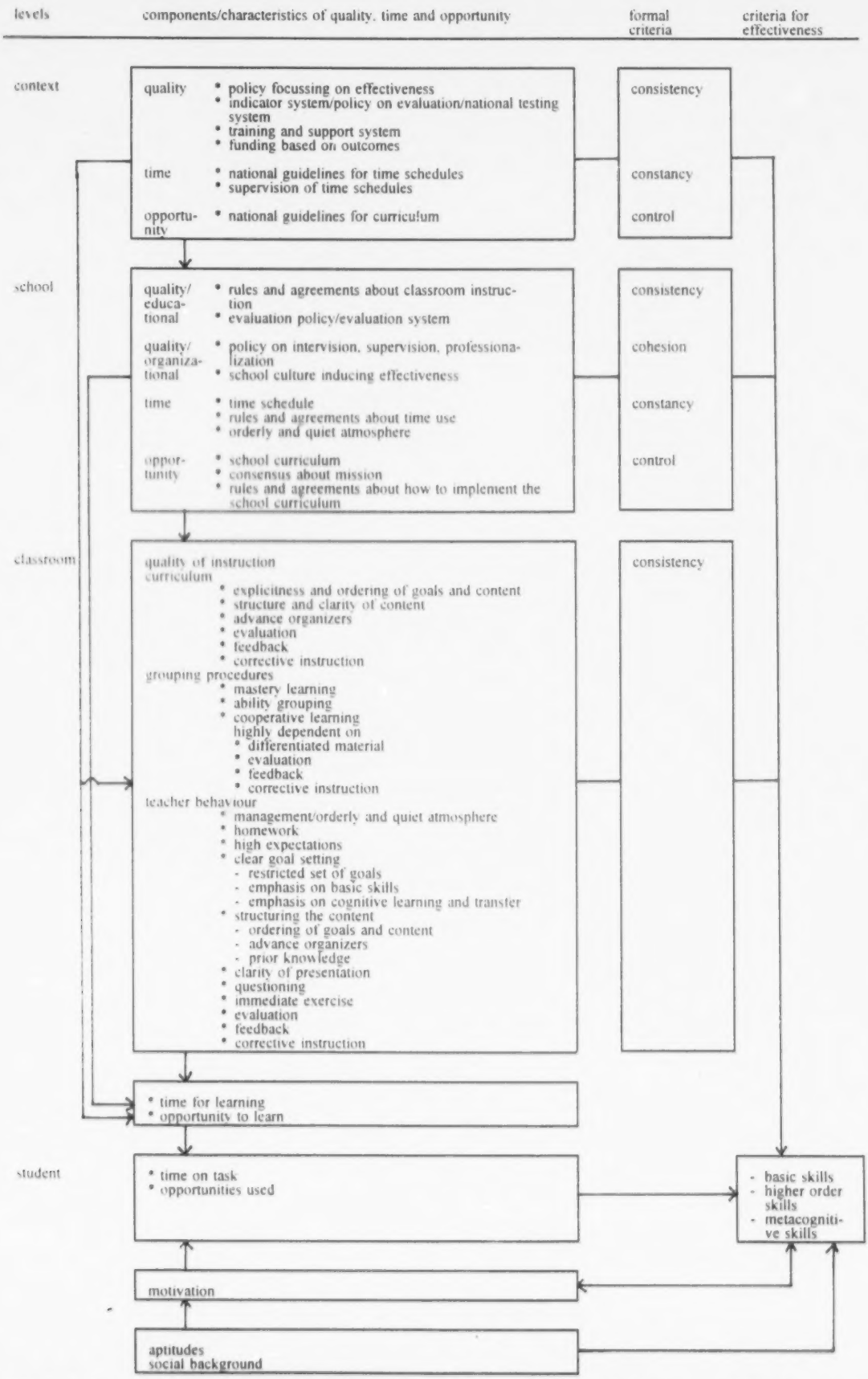

Figure 1 **A comprehensive model of educational effectiveness** (Creemers, 1994)

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